When last we spoke…

- We talked about examination, charting, diagnosis and treatment planning of inflammatory periodontal disease

Today, we're going to discuss….

- Morning:
  - Medical Consultation
  - Periodontal Prognosis
  - Acute Gingival and Periodontal Conditions
- Afternoon:
  - Why pockets don't always resolve after even the best initial therapy…and what to do about it

Medical Consultation

the Who, the What, the When, the How, and Most Importantly, the Why

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Okanagan Periodontal Study Club

November 4, 2017

Objectives

- By the end of this talk, we'll have discussed:
  - **Why** medical consultation is so important
  - **How** to write a medical consultation which makes it easy for physicians to understand and respond to
  - To **whom** (i.e. which physician) it is the most appropriate to send the consultation
  - **When** is the most appropriate time to consult in terms of treatment sequencing
  - **What** are the most important medical issues to consult about

Overview

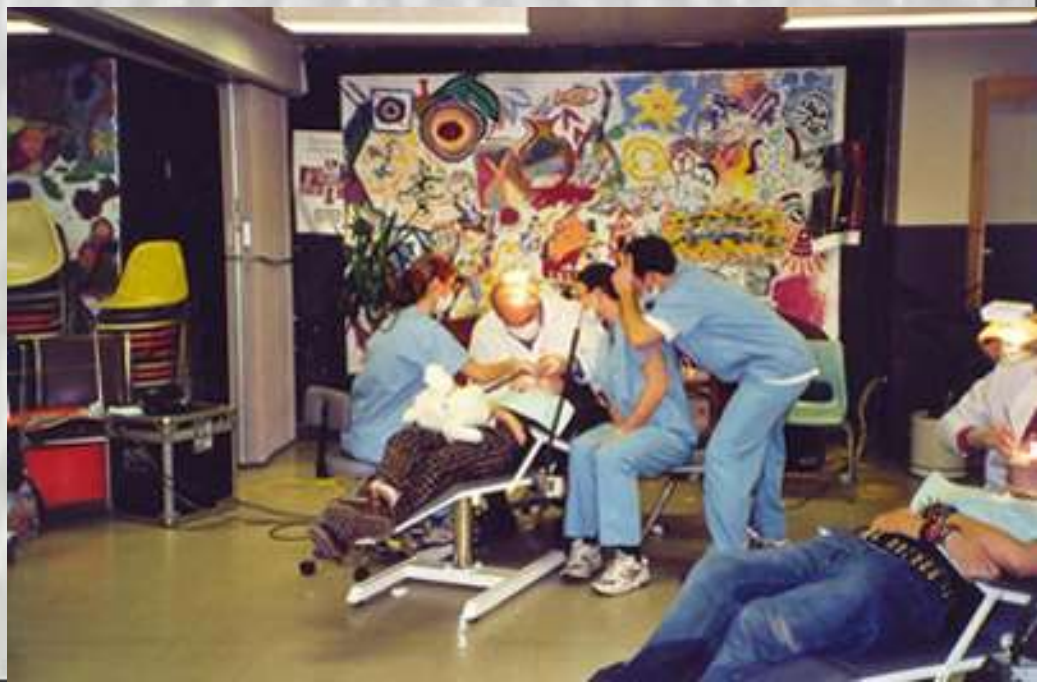
1. Why is medical consultation so important?
2. How do we write a medical consult?
3. A system-by-system approach

Overview

1. Why is medical consultation so important?

Background

- Dentists, dental specialists and hygienists are legitimate healthcare providers, both healers and professionals, who as a body have a social contract with the public we serve, and as individuals have a social contract with our patients



Background

- The days of drill, fill and bill dentistry are long over
- As such, we are responsible for managing our patient's overall health, as primary care providers (general dentist offices), and secondary care providers (specialty offices)

Background

- Regardless of the sort of treatment to which your office is limited,
  1. a patient's medical status may affect your management of them, and
  2. your management of them may affect their medical status

Patient Management = Risk Management

- Ignorance and inattention to a patient's medical status may cause significant morbidity and even mortality
- Further, it exposes us to significant liability

Background

- Further, many patients do not have a family physician, or do not see one on a regular basis
- Dentists have the opportunity to be in the position to pick up on systemic health problems before a patient ever walks in to a physician's office

A Paradigm Shift?

- Evidence suggests that patients are comfortable with, and even willing to pay for, dental offices screening for common/dire medical problems[1]
- Further, dental offices have shown themselves willing to provide this service[2]

Oral Signs of Systemic Disease

- As we are all aware, systemic conditions can have oral manifestations
- These systemic conditions may be undiagnosed, and may require urgent treatment

Medical Management

- Physicians' management of their patients, such as the medications and therapies they prescribe, can have profound effects on dental treatment planning and sequencing
- Physicians may be completely unaware of these effects

Training

- Current programs in dental education include significant time spent learning about the medical management of patients
- There remain, however, a large number of practitioners who did not receive this training

Why Medical Consultation?

- Dentists sometimes need information that can only be provided by physicians
- Dentists can sometimes pick up on systemic diseases before physicians do

Why Medical Consultation?

- Further, dentists can aid physicians and their patients considerably by sensitizing them to the negative intraoral side effects some of their treatments may cause, and how to best sequence treatment to avoid these situations

The Lie of "Medical Clearance"

- Dentists sometimes fall into the habit of seeking permission from physicians to perform treatment, termed "medical clearance"
- Unfortunately, from a medico-legal standpoint, this does not protect us
- Regardless of the documentation we have accumulated in support of a patient's care, we are ultimately responsible for any care we provide[3]

An Issue of Professional Autonomy

- The notion of dentistry as a profession is being challenged[4,5,6]
- One issue central to our being considered a profession is our autonomy in dispensing treatment
- Catch-22: How can we be considered autonomous if we abdicate our responsibility to make the final decisions on the treatments that we provide?[3]

An appropriate interface between physicians and dentists is thus indispensable

Overview

1. Why is medical consultation so important?
2. How do we write a medical consult?

Writing a Medical Consultation

- As we go through this process:
  - Think of what would be the easiest and clearest questions for physicians to answer
  - Think of how asking specific questions will lead to specific answers
  - Think of what decisions are our responsibility to make, vs. what decisions belong to physicians

My Preference

- One approach is to have a form letter
- This letter follows business letter format, but has elements of how in-hospital consultations are written amongst medical professionals
- Pertinent questions, or "items" are chosen based on individual patients' needs; the other items are omitted

Anatomy of a Medical Consultation

- Every good business letter begins with
  - from whom it's coming
  - the date, and
  - to whom it's going
- This is followed by a brief but complete discussion of the patient's
  - dental chief complaint
  - past health history
  - medications (current and past), and
  - allergies

Anatomy of a Medical Consultation

- Next, the diagnosis, followed by the treatment plan, in terms the physician can understand
- Most important is a list of the "items" which you want the physician to consult upon
- Finally, a complimentary closing, and signature, followed by a printed name

Consultant's contact info

Patient's chief complaint

Patient's diagnosis and treatment plan

Your name and address here
Your phone and fax numbers here

Your Contact Info

November 19, 2013

Date

Consultant's name and address here
Consultant's phone and fax numbers here

Re: Patient _____ _____
DOB: --/---/----

Patient's name and birth date

Dear Dr. _____,

Mr./Mrs. _____ was recently seen in our clinic for diagnosis and treatment planning of oral disease. As stated in his/her medical history questionnaire, he/she has a history of _____, _____, and _____. He/she takes _____, _____, and _____ as medications, and has _____ and _____ as allergies. He/she has been diagnosed with _____, and his/her treatment plan calls for _____ under local anaesthetic with vasoconstrictor.

Patient's health history, meds, and allergies

1. Is the patient's medical history, as he/she gave it to me, complete?
2. Mr./Mrs. _____ reports that he/she develops shortness of breath after climbing 2 flights of stairs. This puts him/her at borderline exercise tolerance. Can you order a stress test for confirmation and treat as necessary?
3. Mr./Mrs. _____ takes 5 mg prednisone per day. I will be supplementing him/her by doubling his/her dose to 5 mg prednisone the day of the procedure and for one day afterward. Is this alright with you?
4. Can you order an HbA1c and fax it to, or fax me the most recent results, if they have been taken within the last 3 months?
5. Can you please fax me the patient's most recent CD4+ count and neutrophil count?
6. Would you be amenable to placing the patient on a 3 month drug holiday from the bisphosphonate, as current recommendations hold that such a drug holiday may be beneficial both in the prevention of post-operative osteonecrosis of the jaw and treatment of current outbreaks of it?
7. Can you please provide specific information regarding the dosage in Gy, fractionation, and specific field of irradiation?
8. Do you have any other comments pertinent to this case?

All the "items" you want to ask the physician

Any information would be most welcome.

Sincerely,

Sam Malkinson, *DMD, Cert Perio, FRCD(C)*

Your name and address here
Your phone and fax numbers here

November 19, 2013

Consultant's name and address here
Consultant's phone and fax numbers here

Re: Patient _____ _____
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November 19, 2013

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Re: Patient _____ _____
DOB: --/---/----

Dear Dr. _____,

Mr./Mrs. _____ was recently seen in our clinic for diagnosis and treatment planning of oral disease. As stated in his/her medical history questionnaire, he/she has a history of _____, _____, and _____ . He/she takes _____, _____, and _____ as medications, and has _____ and _____ as allergies. He/she has been diagnosed with _____, and his/her treatment plan calls for _____ under local anaesthetic with vasoconstrictor.

1. Is the patient's medical history, as he/she gave it to me, complete? Yes
2. Mr./Mrs. _____ reports that he/she develops shortness of breath after climbing 2 flights of stairs. This puts him/her at borderline exercise tolerance. Can you order a stress test for confirmation and treat as necessary? Stress test performed, pt has acceptable level of exercise tolerance.
3. Mr./Mrs. _____ takes 5 mg prednisone per day. I will be supplementing him/her by doubling his/her dose to 5 mg prednisone the day of the procedure and for one day afterward. Is this alright with you? Yes
4. Can you order an HbA1c and fax it to, or fax me the most recent results, if they have been taken within the last 3 months? Yes, see attached
5. Can you please fax me the patient's most recent CD4+ count and neutrophil count? Yes, see attached
6. Would you be amenable to placing the patient on a 3 month drug holiday from the bisphosphonate, as current recommendations hold that such a drug holiday may be beneficial both in the prevention of post-operative osteonecrosis of the jaw and treatment of current outbreaks of it? Yes, please advise pt. when you would like him to begin the drug holiday.
7. Can you please provide specific information regarding the dosage in Gy, fractionation, and specific field of irradiation? Yes, see attached
8. Do you have any other comments pertinent to this case? No

Any information would be most welcome.

Sincerely,

Sam Malkinson, *DMD, Cert Perio, FRCD(C)*

In the Health History….

- Be as thorough as possible when reporting all of the patient's current and former diseases and disorders
- List dates when possible (e.g. "patient was hospitalized for pneumonia in September of 2009")
- List treatments undergone where applicable (surgical therapy, chemotherapy, radiation therapy etc.)
- List dosages and schedules of medications where applicable
- List any known allergic reactions that have occurred

In the Treatment Plan….

- Include all planned therapies, even ones that are being referred to specialists, especially specific surgical therapies
- Include details about the sequence, and if appropriate, timing of treatment
- Include information regarding whether you are using local anesthetic with or without vasoconstrictor
- Include any medications that you are planning to prescribe, or any change in dosage/schedule of medications the patient is currently taking

TO BE AVOIDED

- Descriptions which use dental technical terminology
  - Think "lower right first premolar" rather than "#44"
  - Think "filling" rather than "Class 2 composite restoration"
  - Think "bone grafting procedure" rather than "socket preservation"; etc.

"Items"

- The more specific of a question you ask, the more specific of an answer you'll get
- Can be used to check to make certain your patient has given you all the pertinent medical information
- Can also be used to get a physician's overall impression of a case, including any contraindications you may have overlooked

TO BE AVOIDED

- "Medical Clearance" questions
- Questions which ask physicians things that are outside of their sphere of knowledge

To Whom do I Send the Consult?

- Routine consults can be sent to a patient's family physician
- Specialty specific consults can be sent to a patient's specialist, if they have one already
- Urgent consultations can be sent to ER physicians, or to either family physicians or specialists, depending on the type of problem, accompanied by a phone call

Overview

1. Why is medical consultation so important?
2. How do we write a medical consult?
3. A system-by-system approach

Cardiovascular System

- Hypertension
- Congenital Heart Problems
- Acquired Cardiovascular Problems
- Cardiovascular Surgery

Hypertension

- How often do you take your patient's blood pressure?
- Dentists are in an excellent position to screen patients for hypertension[7]

BLOOD PRESSURE CLASSIFICATION FOR ADULTS.*†		
BLOOD PRESSURE CLASSIFICATION	**SBP‡ (mm Hg§)**	**DBP¶ (mm Hg)**
Normal	< 120	and < 80
Prehypertension	120-139	or 80-89
Stage 1 Hypertension	140-159	or 90-99
Stage 2 Hypertension	≥ 160	or ≥ 100

Hypertension

- It is our responsibility to know when we should and should not treat a hypertensive patient, i.e.:
  - If a patient's BP is >180/>110 mmHg, no elective dental care[8]
  - If a spike in BP is accompanied by signs and symptoms of a hypertensive crisis[7]:
    - Severe chest pain
    - Severe headache with confusion or blurred vision
    - Nausea and/or vomiting
    - Shortness of breath
    - Seizures
    - Unresponsiveness

In the Health History….

- "On two separate dental visits, Patient X's blood pressure was 165/105 mmHg."

Item

- "As Patient X's blood pressure places him in Stage 2 Hypertension, and he is not currently undergoing any medical antihypertensive therapy, please evaluate and treat as necessary."

Congenital Heart Problems

- Some examples of congenital heart problems might be:
  - Atrial septal defects
  - Ventricular septal defects
  - Persistent truncus arteriosus
  - Tetralogy of Fallot
  - Pulmonary stenosis
  - Coarctation of the aorta
  - Bicuspid aortic valve
- Depending on the specific congenital heart problem, the defect may require or may have been repaired in such a way that requires antibiotic prophylaxis[9]

In the Health History….

- "Patient X has a history of a ventricular septal defect, but is unaware of how it was repaired."

or

- "Patient X reports having had heart surgery when she was a child, but is unaware of what kind, or what problem was being treated."

Items

- "Can you provide some information as to whether the VSD was repaired with a synthetic or an autogenous graft?"

or

- "Can you provide some information on the heart problem Patient X had as a child, and how it was treated?"

TO BE AVOIDED

- "Should I provide Patient X with antibiotic prophylaxis prior to treatment?"

Acquired Cardiovascular Problems

- Again, dentists are in a position to potentially pick up on risk factors for these life-threatening conditions[10]
- Further, if you suspect your patient might not be cardiovascularly fit to undergo your proposed treatment, consultation may give you enough information to make your final treatment decisions[11]

COMMON RISK FACTORS FOR CORONARY HEART DISEASE.

RISK FACTOR	LEVEL OF RISK	
	Lower	Higher
Age (Years)	< 45 (men) < 55 (women)	> 65
Cigarette Smoking Status	Nonsmoker	Smoker
Blood Pressure (mm Hg*)	SBP† < 140 DBP‡ < 90	SBP ≥ 140 DBP ≥ 90
LDL§ Cholesterol (mg/dL**)	< 100	> 160
HDL†† Cholesterol (mg/dL)	> 60	< 40
Fasting Plasma Glucose (mg/dL)	< 126	≥ 126

In the Health History….

- "Upon taking Patient X's health history, he reported being a current smoker. He has not seen a physician in 5 years. As measured in our office, his blood pressure was 145/95 mmHg, and his plasma glucose was 200 mg/dL. He reported developing shortness of breath after climbing the one flight of stairs up to our office."

In the Treatment Plan….

- "The intended treatment will be performed under local anesthetic, with vasoconstrictor limited to 0.036mg of epinephrine."

Item

- "Patient X's history puts him at a poor level of exercise tolerance. Combined with his age of 68, I am concerned that he is at increased risk of developing coronary artery disease. Can you perform a history, physical, and stress test, and treat as necessary?"

TO BE AVOIDED

- "Patient X's history puts him at a poor level of exercise tolerance. Can you clear him for the proposed procedure?"

Cardiovascular Surgery

- Patients who have undergone cardiovascular surgery may:
  - Require a certain period of convalescence before undergoing invasive dental procedures
  - Have had foreign bodies placed which require antibiotic prophylaxis
  - Be on anticoagulant medications which may require dosage adjustments

In the Health History….

- "Patient X reports having had an arterial stent placed 6 months ago."

or

- "Patient X reports having had an artificial valve placed in his heart 5 years ago. As such, he is on Warfarin, and his INR is kept at 3.5."

Items

- "As an INR of 3.5 will result in excessive bleeding during the proposed procedure, can you please coordinate a tapering heparin protocol to coincide with the date of surgery?"

TO BE AVOIDED

- "Can I proceed with dental treatment, and do I need to prescribe him antibiotic prophylaxis?"

or

- "As an INR of 3.5 will result in excessive bleeding during the proposed procedure, is it alright to stop his Warfarin one week prior to the procedure?"

Respiratory System

- Sleep Apnea

Sleep Apnea

- Untreated sleep apnea can increase the risk of developing
  - HTN
  - MI
  - CVA
  - Arrhythmia
  - Obesity
  - Diabetes
  - ?Periodontitis?[12,13,14]

Table 1
The STOP-BANG questionnaire

First Four Questions	Four Additional Questions
S: snore loudly	B: body mass index >28
T: feel tired during the day	A: age >50 years
O: observed/witnessed to have stopped breathing	N: neck size: male, ≥17 in; female, ≥16 in
P: high blood pressure	G: gender; are you a male
Yes to two or more above: at risk for sleep apnea	Add one or more from above: increased risk for moderate to severe sleep apnea

- Dentists are once again in an excellent position to pick up on this problem before physicians[15]

In the Health History….

- "Patient X reports snoring loudly, and feeling tired during the day. His blood pressure has been measured as 145/95 at two successive dental appointment. His BMI is 29."

Item

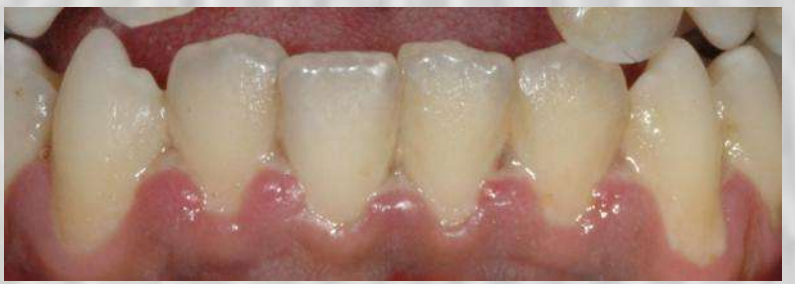
- "Can you please evaluate Patient X for sleep apnea, and treat as necessary?"

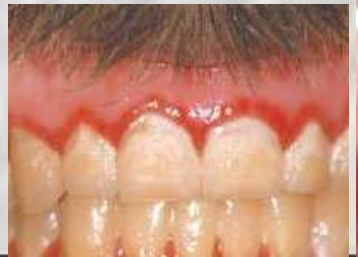
Hematological System

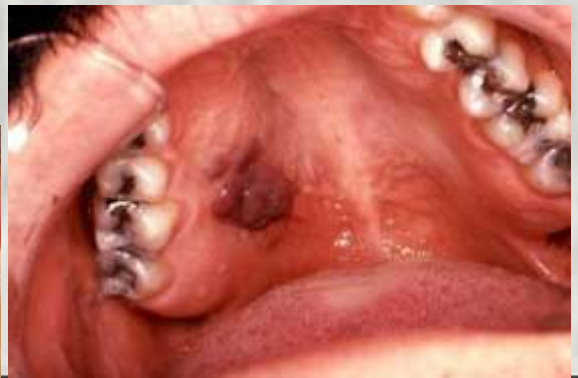
- HIV/AIDS
- WBC Diseases
- Immunosuppression
- Bleeding Disorders

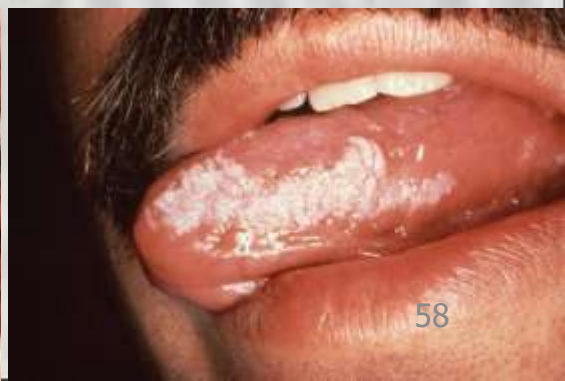
HIV/AIDS – Intra-oral Manifestations

- While fortunately an uncommon occurrence, in theory a patient with undiagnosed HIV could present to your office[16]
- Some of the intra-oral manifestations (more common in a HIV+ population than in a healthy population) include:
  - Hairy leukoplakia
  - Linear gingival erythema
  - Kaposi's sarcoma
  - NUG/NUP









HIV/AIDS - Immunosuppression

- Are all HIV+ patients equally susceptible to post-op infections due to immunosuppression? Of course not!
- Identifying the
  - CD4+ lymphocyte count in cells/μL (<200 carries a diagnosis of AIDS)[16], and,
  - Neutrophil count in cells/μL (<1000 carries an increased risk of developing infections, and <500 carries an increased risk of developing infections from endogenous flora)[17]

  will help us to make the appropriate treatment decisions for our patients
- Beware! There are currently no "official" guidelines for antibiotic coverage in HIV+ patients, or any other immunocompromised patient, for that matter

In the Health History….

- "Patient X reports a history of intravenous narcotic use, with the needle having been shared by multiple individuals. His oral examination has revealed features consistent with hairy leukoplakia on the lateral surfaces of his tongue, as well a linear gingival erythema."

or

- "Patient X reports that he is HIV+, but is unsure of his most recent CD4+ and neutrophil counts."

Items

- "Can you please evaluate Patient X for possible HIV infection and treat as necessary?"

or

- "Can you please send me the results of his most recent CD4+ and neutrophil counts, or perform new ones if they have not been done recently, as his immune status may alter the intended treatment plan, and indicate antibiotic coverage?"

TO BE AVOIDED

- "Patient X reports HIV+ status. Do you advise either antibiotic prophylaxis prior to dental treatment, or post-operative antibiotic coverage?"

Acquired/Congenital WBC Diseases

- A very broad range of problems, such as
  - Qualitative or quantitative neutrophil defects
  - Leukemia/other hematological malignancies
  - Congenital immune deficiencies
  - Select radiotherapy
  - Splenectomy/splenic dysfunction
- The most important is to assess the patient's risk of developing complications, and to inform the physician of possible intra-oral complications[17]
- Further, the dentist may pick up on a hematological problem, just based on intra-oral signs and a good history

In the Health History….

- "Patient X presented with severe gingival inflammation and bleeding. These signs have occurred suddenly in the last 3 weeks, and without any obvious local cause. Further, Patient X complains of recent weight loss, and night sweats, both of which are unusual for him."

Items

- "I am suspecting a hematological disorder. Can you please evaluate the patient's hematological status and treat as necessary?"

Immunosuppression

- Patients may be treatment planned by their physician to begin a course of immunosuppressive medication for reasons as benign as arthritis, and as serious as organ transplantation or cancer treatment
- In a perfect world, the physician in question would send us a consult first
- This does not always happen

In the Health History….

- "Patient X has informed me that he has recently undergone immunosuppressive chemotherapy to treat a hematological malignancy."

Item

- "We advise all our patients to get complete dental examinations and appropriate treatments prior to beginning any form of immunosuppressive therapy. However, as Patient X was unable to do so, can you please perform a complete blood count with differential and send me the results?"

Bleeding Disorders

- A variety of scenarios may cause excess bleeding:
  - Diseases/disorders (von Willebrand's Disease, hemophilia A and B, thrombocytopenia, etc.)
  - Anticoagulant medications (Warfarin, heparin, enoxaparin etc.)
  - Anti-platelet medications (Aspirin, Plavix, Aggrenox etc.)

Bleeding Disorders

- Patients with a known history of a bleeding disorder must have appropriate lab tests done in consultation with a hematologist, because the results may indicate treatment on the part of the hematologist prior to dental treatment
- Suspected bleeding disorders must be referred for consultation[18]

Symptom	Criteria
Epistaxis:	Any nosebleed that causes interference or distress with daily or social activities.
Cutaneous bleeding	Bruises are considered significant when 5 or more (> 1cm) in exposed areas.
Minor cutaneous wound:	Any bleeding episode caused by superficial cuts (e.g., by shaving razor, knife, or scissors) or that requires frequent bandage changes.
Oral cavity bleeding:	Gum bleeding should be considered significant when it causes frankly bloody sputum and lasts for 10 minutes or longer on more than one occasion. Tooth eruption or spontaneous tooth loss bleeding should be considered significant when it requires assistance or supervision by a physician, or lasts at least 10 minutes. Bleeding occurring after bites to lips, cheek, and tongue should be considered significant when it lasts at least 10 minutes or causes a swollen tongue or mouth.
Tooth extraction:	Any bleeding occurring after leaving the dentist's office and requiring a new, unscheduled visit or prolonged bleeding at the dentist's office causing a delay in the procedure or discharge.
Surgical bleeding:	Any bleeding judged by the surgeon to be abnormally prolonged, that causes a delay in discharge, or requires some supportive treatment.
Menorrhagia:	Any bleeding that interferes with daily activities such as work, housework, exercise or social activities during most menstrual periods.

In the Health History….

- "Patient X reports having been diagnosed with von Willebrand's disease 15 years ago. He has not been followed regularly by a physician."

Item

- "Due to the extent of the planned surgical procedure, significant bleeding is anticipated. Can you please assess and report on the severity of Patient X's coagulopathy, and coordinate any necessary hematological treatment with the intended surgical treatment?"

TO BE AVOIDED

- "Is it alright for me to proceed with the intended surgical procedure?"

Endocrine System

- Thyroid Dysfunction
- Diabetes
- Adrenal Suppression

Thyroid Dysfunction

- Very commonly seen
- Ensuring proper thyroid control prior to dental care is very important
- Also important is referring any possibly undiagnosed case to the appropriate physician, as uncontrolled hypothyroidism can lead to cardiovascular problems, and uncontrolled hyperthyroidism can result in thyrotoxicosis, which can end up in a "thyroid storm:"[19]
  - Fever
  - Dehydration
  - Weakness
  - Rapid or irregular heart rate
  - Nausea/vomiting/diarrhea
  - Confusion/disorientation
  - Heart failure
  - Death

Thyroid Control

- Control can be assessed based on a TSH assay (normal value 0.7-5.3 mIU/mL), presence/absence of symptoms, combined with the patient's self-reported history on duration and compliance with treatment[19]

ORAL MANIFESTATIONS OF THYROID DISEASE.

HYPERTHYROIDISM

- Increased susceptibility to caries
- Periodontal disease
- Presence of extraglandular thyroid tissue (struma ovarii—mainly in lateral posterior tongue)
- Accelerated dental eruption
- Burning mouth syndrome

HYPOTHYROIDISM

- Salivary gland enlargement
- Macroglossia
- Glossitis
- Delayed dental eruption
- Compromised periodontal health—delayed bone resorption
- Dysgeusia

In the Health History….

- "Patient X has not seen a physician in 10 years. Intra-orally, her examination has revealed macroglossia, salivary gland enlargement, and poor periodontal health. She is overweight, and her respiratory rate is low at 8 breaths/min."

or

- "Patient X has reported a history of hyperthyroidism, which she states is being treated."

Items

- "Can you please assess the patient for possible hypothyroidism?"

or

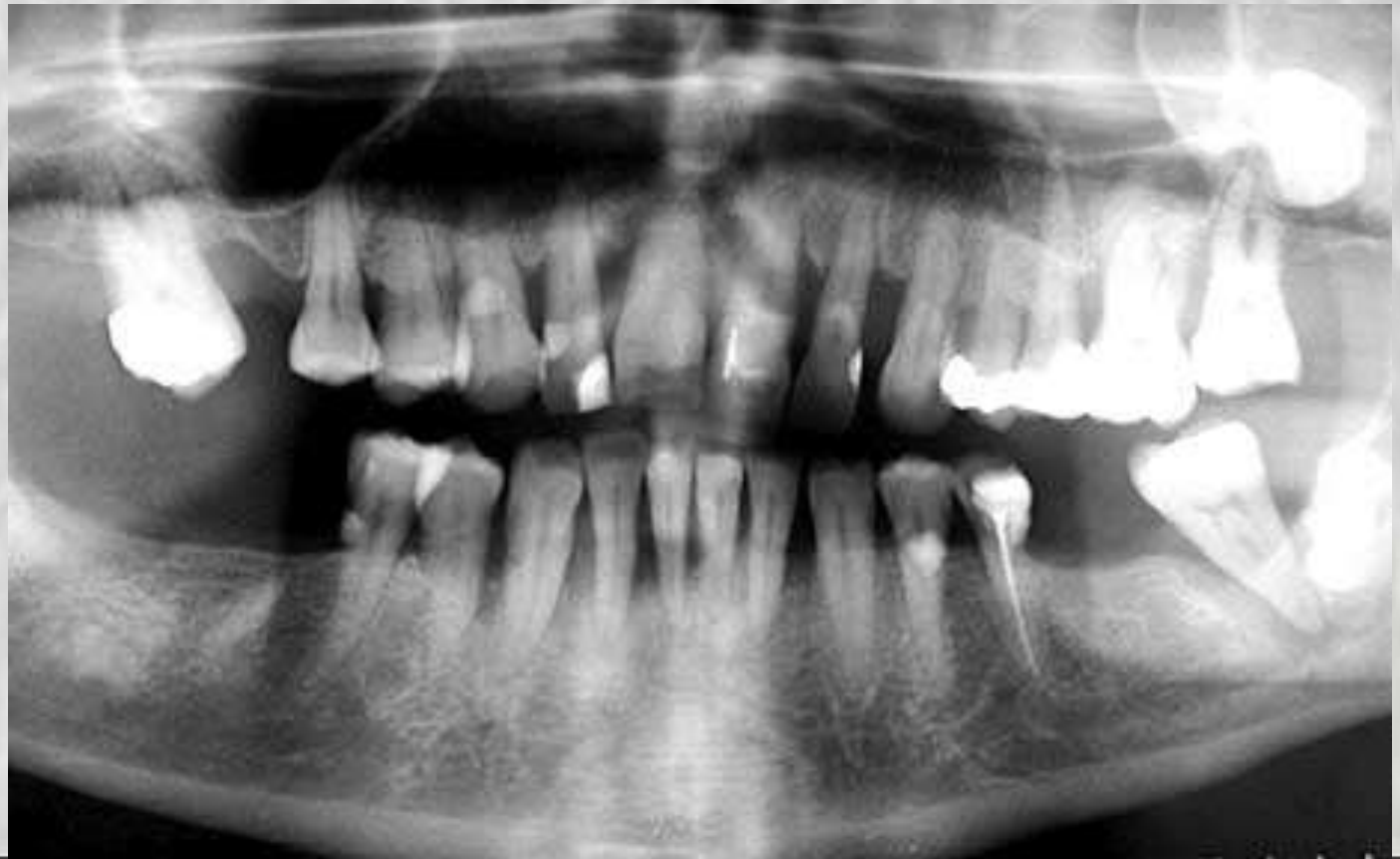
- "Can you please send me the results of her most recent thyroid function test, or perform a new one if one has not been done recently?"

Diabetes Mellitus

- Due to the chronic nature of DM, multiple systems in the body may be affected:
  - Cardiovascular system
  - Renal system
  - Retina
  - Nervous system
  - **Periodontium**
- There are both acute and chronic issues that need to be addressed for a diabetic

Diabetes Mellitus – Periodontal Abscesses

- Multiple periodontal abscesses are nearly pathognomonic of an uncontrolled diabetic state




Dead giveaway!
-Charles Ramsey
Cleveland 2013

Diabetes Mellitus – Periodontitis

- We know that patients with uncontrolled DM are more likely to have periodontitis, and that the severity of their disease worsens if they are uncontrolled
- Further, patients with post-operative blood glucose levels >200 mg/dL are much more likely to experience post-surgical complications[20,21]

Diabetes Mellitus - Monitoring

- Diagnosis and acute monitoring of diabetes is based on plasma glucose levels
- $HbA1_c$, on the other hand, gives information about blood glucose concentration over the preceding

Table 1. American Diabetes Association criteria for the diagnosis of diabetes mellitus, impaired glucose tolerance (IGT), and impaired fasting glucose (IFG)

	Normal	Diabetes	IGT	IFG
Fasting glucose (mg/dl)	<100	⩾126		100–125
Casual glucose (mg/dl)		⩾200		

Table 4. Correlation between hemoglobin A_{1c} levels and mean plasma glucose levels

HbA_{1c} (%)	Mean plasma glucose	
	mg/dl	mmol/l
6	135	7.5
7	170	9.5
8	205	11.5
9	240	13.5
10	275	15.5
11	310	17.5
12	345	19.5

Hemoglobin A_{1c} provides an estimate of the average glucose level. It does not account for short-term fluctuation in plasma glucose levels.

In the Health History….

- "Patient X has a recent history of MI. He is not currently being followed by a physician. His oral exam revealed multiple periodontal abscesses."

or

- "Patient X reported having been diagnosed with type 1 diabetes mellitus, and takes insulin as part of his treatment, in a Lispro formation 15 units before breakfast, lunch, and dinner each, and in a Lantus formation 15 units before bedtime."

Items

- "Can you please perform a fasting plasma glucose test to assess the patient for diabetes?"

or

- "Can you please fax me Patient X's most recent HbA_{1c} value, or perform a new test if one has not been done in the last 3 months?"

Adrenal Suppression

- Glucocorticoid output by the adrenal glands is an important feature of the body's response to surgical stress
- Primary adrenal insufficiency is a relatively uncommon occurrence
- Much more common is secondary adrenal insufficiency due to exogenous corticosteroid administration

Commonly Prescribed Glucocorticoids

Medscape® www.medscape.com

Corticosteroid	Relative Antiinflammatory Activity	Relative Mineralocorticoid Activity	Equivalent Dose (mg)	Plasma Half-life (min)
Cortisone	0.8	0.8	25	30
Hydrocortisone	1.0	1.0	20	90
Prednisone	4.0	0.8	5	60
Prednisolone	4.0	0.8	5	200
Triamcinolone	5.0	0.0	4.0	300
Methylprednisolone	5.0	0.0	4.0	180
Betamethasone	25.0	0.0	0.75	100–300
Dexamethasone	25–30	0.0	0.75	100–300
Fludrocortisone	10	125	—	200

Adrenal Suppression

- A person may be suspected of adrenal suppression if he has been taking >5-10mg* of Prednisone[23] for >3 weeks[24,25]
- In theory, surgery can precipitate an adrenal crisis in patients whose adrenal glands are unable to respond to the stress[26]

ADRENAL CRISIS

Severe glucocorticoid deficiency with or without mineralocorticoid deficiency due to stress (for example, surgery, infection) and inability of adrenal cortex to meet demand

Major categories:

- Gastrointestinal (nausea, vomiting, diarrhea, stomach cramps)
- Hypotension, weak pulse, profuse sweating, weakness, fatigue
- Headache, sunken eyes, cyanosis
- Fever, dehydration, dyspnea progressing to hypothermia
- Myalgias, arthralgia

DENTAL PROCEDURES AND RECOMMENDED CORTICOSTEROID SUPPLEMENTATION IN PATIENTS WITH ADRENAL INSUFFICIENCY.*

NEGLIGIBLE RISK CATEGORY

- Nonsurgical dental procedures
  Regimen: No supplementation required

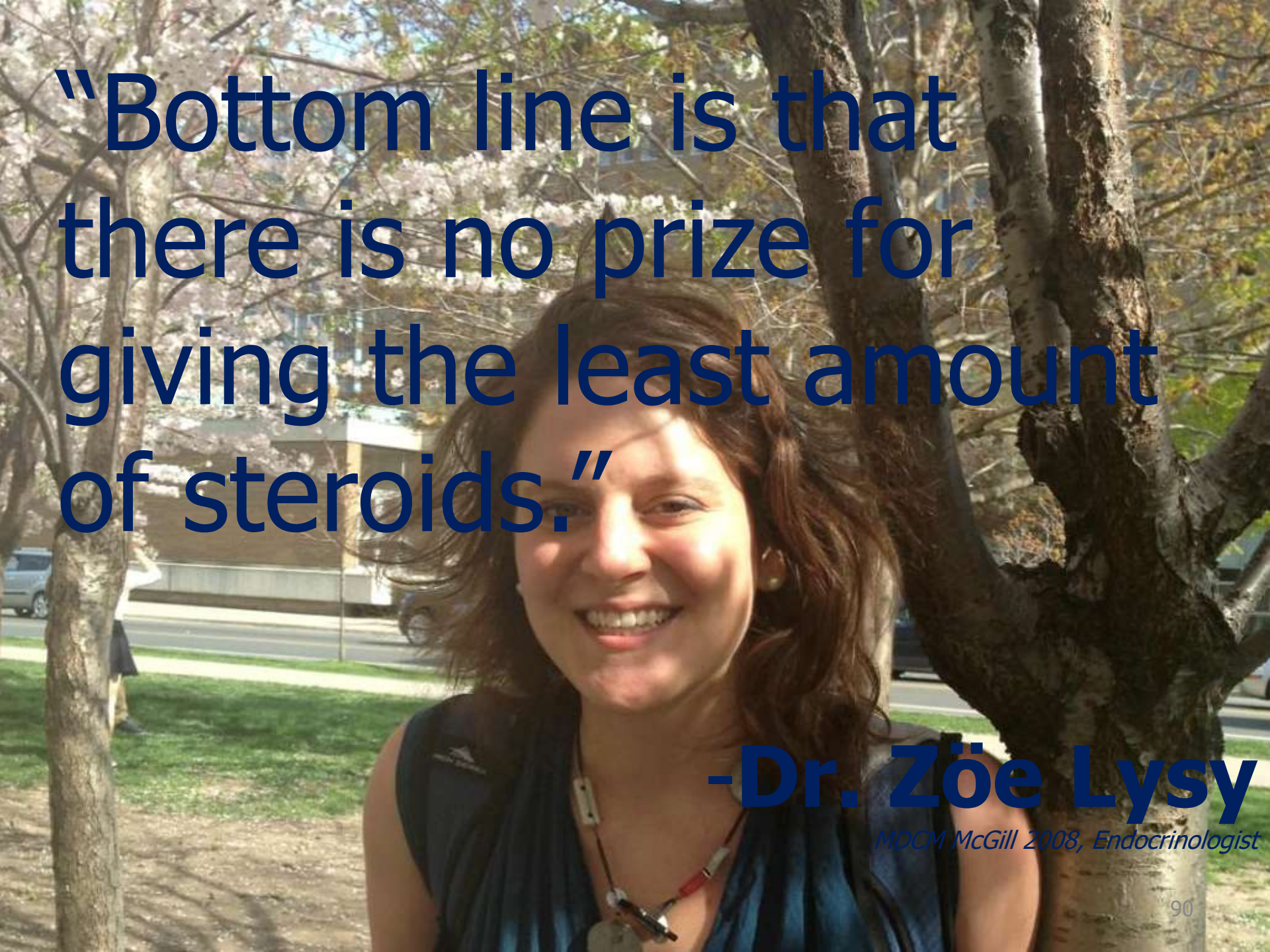
MILD RISK CATEGORY

- Minor oral surgery: A few simple extractions, biopsy
- Minor periodontal surgery
  Regimen: The glucocorticoid target is about 25 milligrams of hydrocortisone equivalent (5 mg of prednisone) the day of surgery

MODERATE-TO-MAJOR RISK CATEGORY

- Major oral surgery: Multiple extractions, quadrant periodontal surgery, extraction of bony impactions, osseous surgery, osteotomy, bone resections, cancer surgery, surgical procedures involving general anesthesia, procedures lasting more than one hour, procedures associated with significant blood loss
  Regimen: The glucocorticoid target is about 50 to 100 mg per day of hydrocortisone equivalent the day of surgery and for at least one postoperative day

* General anesthesia, infection and pain can increase the risk of adrenal crisis in susceptible patients.


"Bottom line is that there is no prize for giving the least amount of steroids."
-Dr. Zöe Lysy
MDCM McGill 2008, Endocrinologist

Major Caveat

- There is one subset of patients for whom you have to be VERY CAREFUL before prescribing supplemental steroids, and those are DIABETICS
- Why? Because glucocorticoids have effects antagonistic to insulin, and will tend to raise blood glucose

In the Health History….

- "Patient X reports taking 10mg of prednisone daily for the last 6 months."

In the Treatment Plan….

- "As the proposed procedure involves moderate surgical stress, I will be supplementing him an extra 10mg of Prednisone the day of the surgery and one day after, before telling him to return to his normal daily dosage."

Item

- "As Patient X is diabetic, and the Prednisone will raise his level of blood glucose, can you please consult with him on how to monitor and appropriately adjust the dosages of his insulin/oral hypoglycemic during the day of surgery and one day afterward?"

TO BE AVOIDED

- "As the proposed procedure involves moderate stress, should I give him supplemental steroids, and if yes, how much and for how long?"

Hepatic and Renal Systems

- Liver Dysfunction
- Renal Dysfunction

Liver Dysfunction

- Liver dysfunction can come in different forms[27]:
  - Damage due to hepatitis
  - Alcoholic liver disease
  - Diseases such as Wilson's Disease, hepatocellular carcinoma
- There are two basic issues with a possibly dysfunctional liver:
  - Will the patient's blood clot normally? (Vit K-dependant clotting factors are activated in the liver)
  - Can the patient metabolize the medications you would like to put him on?

Liver Function Tests

- There are a series of tests which can identify whether or not a liver is functioning normally[28,29]:
  - AST (aspartate aminotransferase), ALT (alanine transaminase)
  - ALP (alkaline phosphatase)
  - Bilirubin
  - Albumin
  - INR

In the Health History….

- "Patient X reports being diagnosed with Hepatitis C."

Item

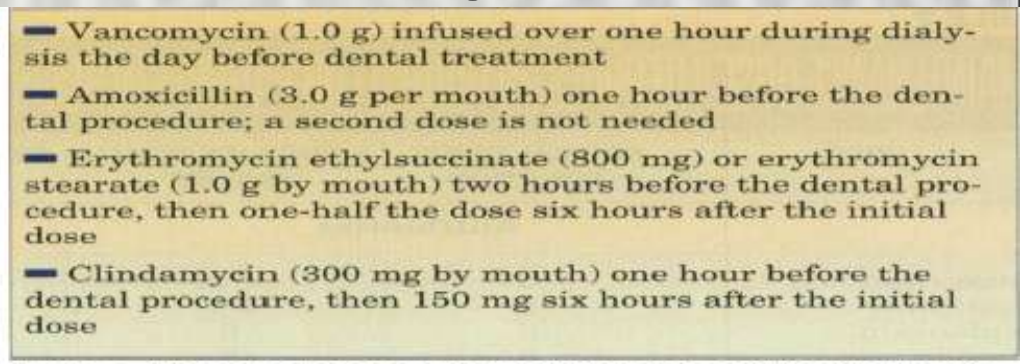
- "Can you please perform an INR and liver function tests to assess her hepatic status, and send me the results with your assessment?"

TO BE AVOIDED

- "Can you assess the patient's liver function to provide clearance for the proposed treatment?"

Renal Dysfunction

- Patients receiving hemodialysis for renal insufficiency or failure require special attention
- Some of the dentally-relevant issues arising out of patients with renal dysfunction involve[30]:
  - Excessive bleeding
  - Anemia (may alter your prescription of medications)
  - Increased susceptibility to infections arising from bacteremia



- Vancomycin (1.0 g) infused over one hour during dialysis the day before dental treatment
- Amoxicillin (3.0 g per mouth) one hour before the dental procedure; a second dose is not needed
- Erythromycin ethylsuccinate (800 mg) or erythromycin stearate (1.0 g by mouth) two hours before the dental procedure, then one-half the dose six hours after the initial dose
- Clindamycin (300 mg by mouth) one hour before the dental procedure, then 150 mg six hours after the initial dose

Figure 3. Suggested changes for bacterial endocarditis prophylaxis for patients receiving hemodialysis.

In the Health History….

- "Patient X has reported that he is on hemodialysis for end-stage renal disease."

In the Treatment Plan….

- "Owing to the invasive nature of the procedure, I will be providing Patient X with prophylactic antibiotic coverage of 3g of amoxicillin."

Item

- "Can you please perform an INR, and complete blood count with differential, and send the results to me, along with the patient's dialysis schedule?"

TO BE AVOIDED

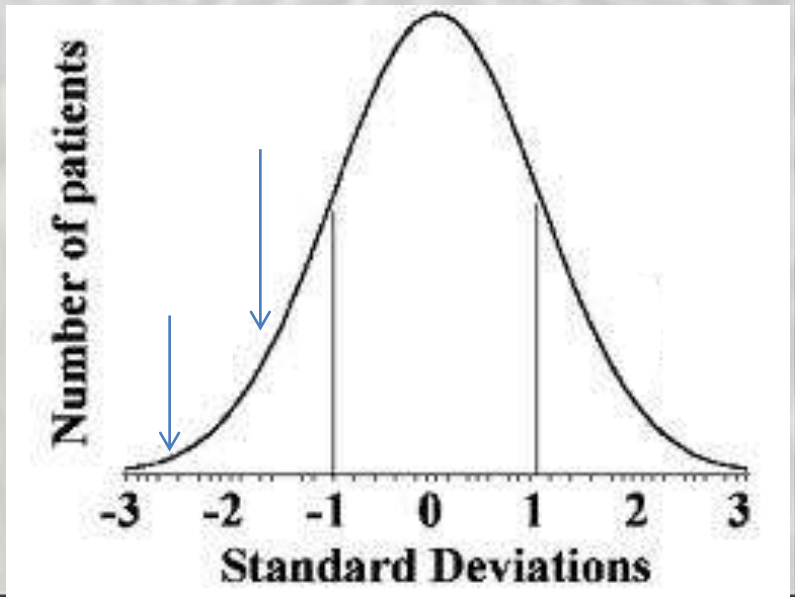
- "Is there any contraindication to performing treatment, and do I need to provide antibiotic prophylaxis?"

Skeletal System

- Osteoporosis/Bisphosphonates
- Radiation Therapy

Osteoporosis

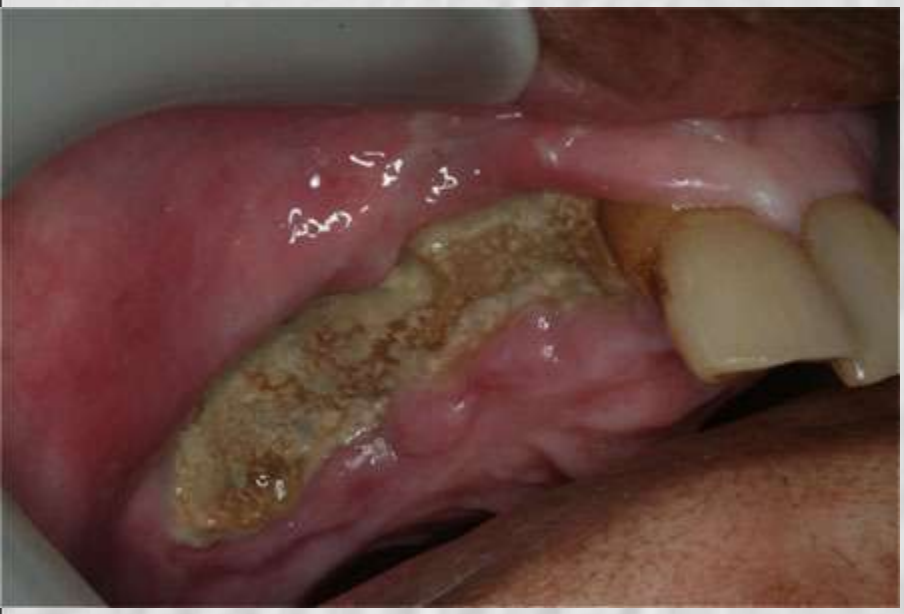
- Very common in aging populations, especially women
- Diagnosis is based on normal population curves of bone mineral density
- A patient is diagnosed as:
  - osteoporotic if they are 2.5 standard deviations below the mean, and
  - osteopenic if they are 1.5-2.4 standard deviations below the mean

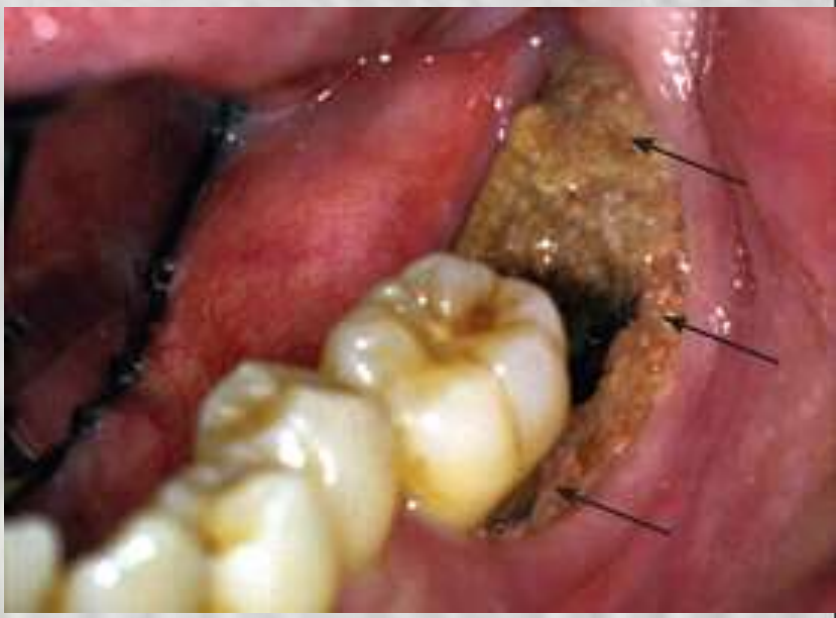


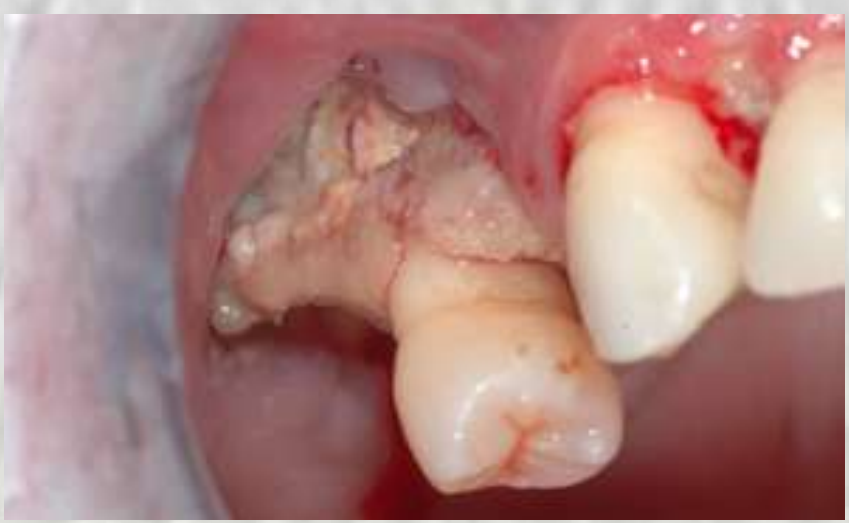
Bisphosphonates

- The main reason dentists need to be concerned about osteoporosis is that bisphosphonate treatment is currently one of the most commonly used treatment regimens
- Bisphosphonate treatment may predispose people to osteonecrosis of the jaw following extractions and other surgical treatment
- The consequences of ONJ can be DIRE

ONJ







Bisphosphonates

- Major controversies regarding how to deal with this clinical situation
- Current "recommendations" are not as supported by evidence as we would like for them to be[31,32]
- Regardless, to make an informed decision regarding appropriate treatment for this ever-growing patient population, we need specific information from the healthcare provider who has prescribed the bisphosphonate

In the Health History….

- "Patient X has informed me that she is taking a bisphosphonate, but is unsure of which one and for how long she has been taking it."

Items

- "Can you please provide information on the specific medication, route of administration, time course and dosage of her treatment."

and

- "As I am planning a surgical procedure, is it alright with you if we place her on a drug holiday from the bisphosphonate for 3 months prior to proceeding with the procedure?"

and

- "We advise for all patients about to begin bisphosphonate treatment to undergo comprehensive dental examination and treatment, to eliminate all possible future sources of infection and to reduce the need for any future surgical procedures."

TO BE AVOIDED

- "What is the risk of the patient developing osteonecrosis of the jaw following the intended procedure?"

Radiation Therapy

- Patients who have undergone radiation therapy to the head and/or neck may be at risk for developing osteoradionecrosis
- To assess a patient's risk, some important information[33,34] we need includes:
  - Specific field of radiation
  - Dosage in Gy (>60 Gy associated with higher risk of developing osteoradionecrosis)
  - Specific dose to the mandible

In the Health History….

- "Patient X has informed me that she underwent radiation therapy for thyroid cancer in 2009."

Item

- "Can you provide information on the dosage in Gy that Patient X received and the specific field which was irradiated? If possible, can you also provide the dosage in Gy that the mandible received?"

TO BE AVOIDED

- "Can you assess the risk of the patient developing osteoradionecrosis following the intended procedure?"

Miscellaneous

- Cervical Lymphadenopathy
- Pregnancy

Cervical Lymphadenopathy

- Enlarged lymph nodes are a non-specific sign that can be present in a host of infectious, immune-related, neoplastic, endocrine, and other types of disorders[35]

Table 1 Causes of lymphadenopathy

I. Infectious Diseases
   a. Viral—infectious mononucleosis (EBV, CMV), infectious hepatitis, herpes simplex, HHV-6, VZV, rubella, measles, adenovirus, HIV
   b. Bacterial—streptococcus, staphylococcus, cat-scratch disease, brucellosis, tularemia, chancroid, tuberculosis, atypical mycobacterial infection, primary and secondary syphilis, diphtheria, leprosy
   c. Fungal—histoplasmosis, coccidioidomycosis, paracoccidioidomycosis
   d. Chlamydial—lyphogranuloma venereum, trachoma
   e. Parasitic—toxoplasmosis, leismaniasis, trypanosomiasis, filariasis
   f. Rickettsial—scrub typhus, richettsialpox

II. Immunologic diseases
   a. Rheumatoid arthritis
   b. Mixed connective tissue disease
   c. Systemic lupus erythematosus
   d. Dermatomyositis
   e. Sjogren's syndrome
   f. Serum sickness
   g. Drug hypersensitivity
   h. Primary biliary cirrhosis
   i. Graft-vs-host disease
   j. Silicone-associated

III. Malignant diseases
   a. Hematologic (Hodgkin's, non-Hodgkin's, ALL, CLL, hairy cell leukemia, malignant histocytosis, T-cell lymphoma, multiple myeloma with amyloidosis)
   b. Metastatic—from primary sites

IV. Lipid storage disease—Gaucher's, Niemann-Pick, Tangier

V. Endocrine disease—hyperthyroid, adrenal insufficiency, thyroiditis

VI. Other disorders
   a. Castleman's disease (giant lymph node hyperplasia)
   b. Sarcoidosis
   c. Dermatopathic lymphadenitis
   d. Lymphomatoid granulomatosis
   e. Kikuchi's disease (histiocytic nectrotizing lymphadenitis)
   f. Kawasaki's disease (mucocutaneous lymph node syndrome)
   g. Histocytosis X
   h. Severe hypertriglyceridemia

Cervical Lymphadenopathy

- To differentiate between possible causes, a thorough history must be taken, and sometimes, some lab values must be requested
- Because of the morbidity/mortality associated with some of the causes of cervical lymphadenopathy, and because sometimes it presents as part of the routine course of an already diagnosed illness, medical consultation is very important

Table 3	Clinical evaluation of cervical lymphadenopathy
Location	
	Identify the anatomical location (ie, cervical, submandibular, submental, supraclavicular, occipital, preauricular, auricular, axial inguinal)
	Identify the presence of single or multiple doses
	Identify the presence of localized or disseminated nodes
	Determine if palpable nodes are unilateral or bilateral
Consistency	
	Firm
	Soft
	Rubbery
	Rock hard
	Movable
	Fixed
Size	
	< 1 cm^2, > 1 cm^2
	If nodes are bilateral, check the symmetry
Symptoms	
	Asymptomatic
	Tender
	Painful
	Associated with systemic symptoms

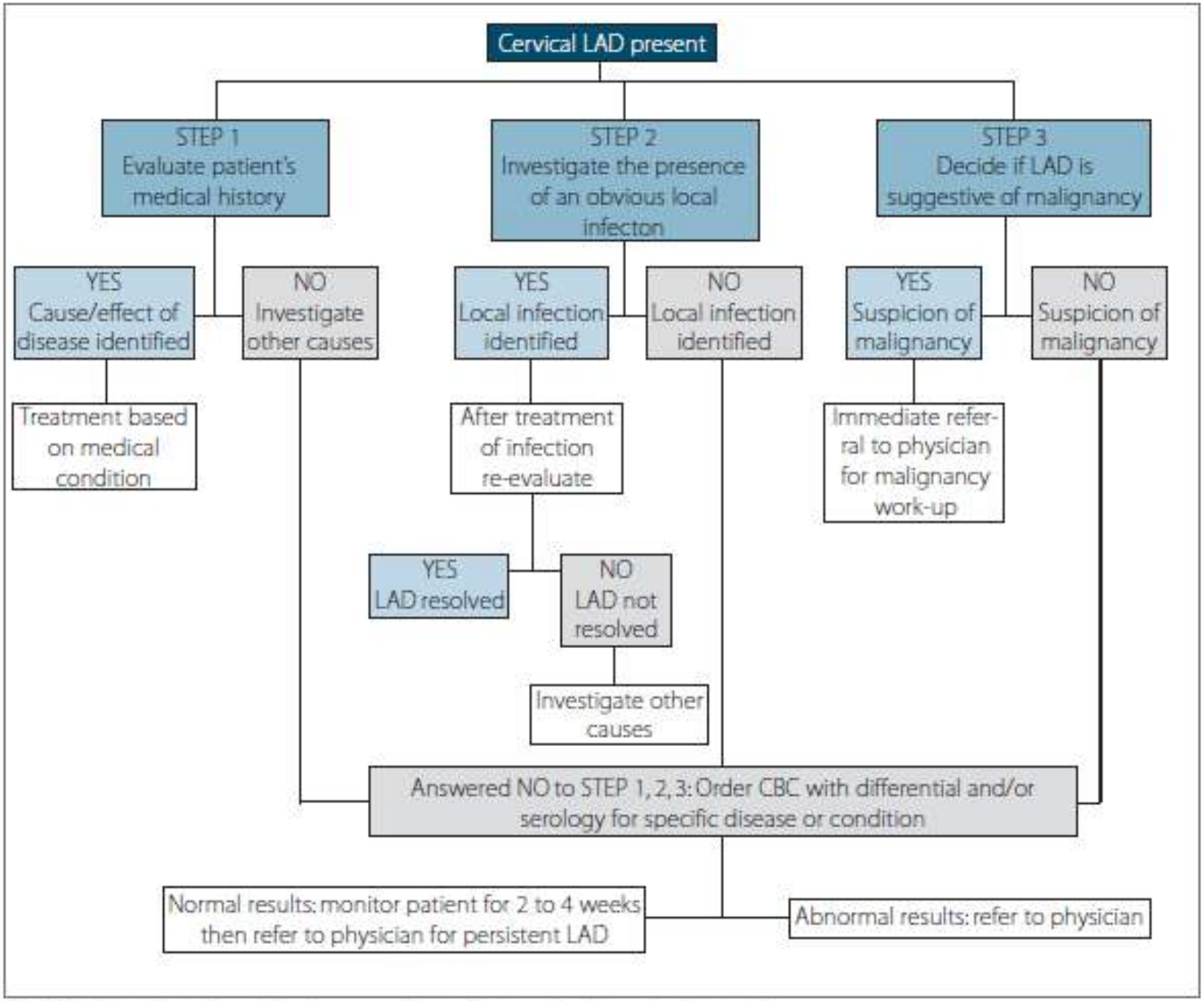


Fig 3 Algorithm for patients presenting with cervical lymphadenopathy.

In the Health History….

- "During a routine dental checkup, Patient X presented with a firm, enlarged lymph node 1cm in diameter on the anterior surface of his right sternocleidomastoid muscle, midway up his neck. This node is tender to palpation, and has been present for 2 weeks. After some discussion, Patient X admitted to experiencing some unexpected weight loss during that time, as well as fever and night sweats, which he does not usually get."

Item

- "Can you please evaluate and treat Patient X as necessary for suspected malignancy, and report back on the findings?"

Pregnancy

- Pregnant patients require special dental attention, not NO dental attention
- A significant number of dentists report being uncomfortable with treating pregnant patients[36]
- Intra-oral problems may be associated with adverse pregnancy outcomes[37,38]

Pregnancy – Treatment Sequencing

- Dental work is best done in the second trimester and first half of the third trimester[39]
- Dental work can be categorized into
  - Elective treatment – defer until after pregnancy
  - Time-sensitive treatment – 2nd trimester or first half of 3rd trimester
  - Emergency treatment – any time

Pregnancy - Medications

- The FDA has come up with pregnancy risk categories for medications
- Be aware of into what category the medication you want to prescribe falls[40]

U.S. Food and Drug Administration pregnancy risk factor definitions.*

CATEGORY	DEFINITION
A	The results of controlled studies in women fail to demonstrate a risk to the fetus in the first trimester (and there is no evidence of risk in later trimesters), and the possibility of fetal harm appears remote
B	Either the results of animal reproduction studies have not demonstrated a fetal risk but there are no controlled studies in pregnant women OR the results of animal reproduction studies have shown an adverse effect (other than a decrease in fertility) that was not confirmed in controlled studies in women in the first trimester and there is no evidence of risk in later trimesters
C	Either the results of studies in animals have revealed adverse effects (teratogenic, embryocidal or other) on the fetus and there are no controlled studies in women OR results of studies in women and animals are not available; drug should be given only if the potential benefit justifies the potential risk to the fetus
D	There is positive evidence of human fetal risk, but the benefits of use in pregnant women may be acceptable despite the risk (for example, if the drug is needed in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective)
X	Results of studies in animals or humans have demonstrated fetal abnormalities or evidence of fetal risk based on human experience, or both, and the risk of the use of the drug in pregnant women clearly outweighs any possible benefit; use of the drug is contraindicated in women who are or may become pregnant

* Sources: U.S. Food and Drug Administration.[8,20,21]

Key medication considerations during pregnancy and breast-feeding.

AGENT	FDA PR* CATEGORY	SAFE DURING PREGNANCY?	SAFE DURING BREAST-FEEDING?
Analgesics and Anti-inflammatories†			
Acetaminophen	B	Yes	Yes
Aspirin	C/D	Avoid	Avoid
Codeine	C	Use with caution	Yes
Glucocorticoids (dexamethasone, prednisone)	C	Avoid‡	Yes
Hydrocodone	C	Use with caution	Use with caution
Ibuprofen§	C/D	Avoid use in third trimester	Yes
Oxycodone	B	Use with caution	Use with caution
Antibiotics¶#			
Amoxicillin	B	Yes	Yes
Azithromycin	B	Yes	Yes
Cephalexin	B	Yes	Yes
Chlorhexidine (topical)	B	Yes	Yes
Clarithromycin	C	Use with caution	Use with caution
Clindamycin	B	Yes	Yes
Clotrimazole (topical)	B	Yes	Yes
Doxycycline	D	Avoid	Avoid
Erythromycin	B	Yes	Use with caution
Fluconazole	C/D	Yes (single-dose regimens)	Yes
Metronidazole	B	Yes	Avoid; may give breast milk an unpleasant taste
Nystatin	C	Yes	Yes
Penicillin	B	Yes	Yes
Terconazole (topical)	B	Yes	Yes
Tetracycline	D	Avoid	Avoid
Local Anesthetics			
Articaine	C	Use with caution	Use with caution
Bupivacaine	C	Use with caution	Yes
Lidocaine (with or without epinephrine)	B	Yes	Yes
Mepivacaine (with or without levonordefrin)	C	Use with caution	Yes
Prilocaine	B	Yes	Yes
Benzocaine (topical)	C	Use with caution	Use with caution
Dyclonine (topical)	C	Yes	Yes
Lidocaine (topical)	B	Yes	Yes
Tetracaine (topical)	C	Use with caution	Use with caution
Sedatives			
Benzodiazepines	D/X	Avoid	Avoid
Zaleplon	C	Use with caution	Use with caution
Zolpidem	C	Use with caution	Yes
Emergency Medications			
Albuterol	C	Steroid and β_2-agonist inhalers are safe	Yes
Diphenhydramine	B	Yes	Avoid
Epinephrine	C	Use with caution	Yes
Flumazenil	C	Use with caution	Use with caution
Naloxone	C	Use with caution	Use with caution
Nitroglycerin	C	Use with caution	Use with caution

* FDA PR: U.S. Food and Drug Administration Pregnancy Risk. See Table 1 for FDA PR category definitions.

† In the case of combination products (such as oxycodone with acetaminophen), the safety with respect to either pregnancy or breast-feeding is dependent on the highest-risk moiety. In the example of oxycodone with acetaminophen, the combination of these two drugs should be used with caution, because the oxycodone moiety carries a higher risk than the acetaminophen moiety.

‡ Oral steroids should not be withheld from patients with acute severe asthma.

§ Ibuprofen is representative of all nonsteroidal anti-inflammatory drugs. In breast-feeding patients, avoid cyclooxygenase selective inhibitors such as celecoxib, as few data regarding their safe use in this population are available, and avoid doses of aspirin higher than 100 milligrams because of risk of platelet dysfunction and Reye syndrome.

¶ Antibiotic use during pregnancy: The patient should receive the full adult dose and for the usual length of treatment. Serious infections should be treated aggressively. Penicillins and cephalosporins are considered safe. Use higher-dose regimens (such as cephalexin 500 mg three times per day rather than 250 mg three times per day), as they are cleared from the system more quickly because of the increase in glomerular filtration rate in pregnancy.

Antibiotic use during breast-feeding: These agents may cause altered bowel flora and, thus, diarrhea in the baby. If the infant develops a fever, the clinician should take into account maternal antibiotic treatment.

In the Health History….

- "Patient X has informed me that she is 10 weeks pregnant."

Item

- "We advise that all pregnant patients who have not undergone a recent dental check-up be referred to their dentist as part of their routine obstetric care. Can you please confirm the expected delivery date for Patient X's baby, so that we can plan our treatment sequence accordingly?"

TO BE AVOIDED

- "What is the limit on the epinephrine I am allowed to use with my local anesthetic?"

and

- "What antibiotic and analgesic should I prescribe if it becomes necessary?"

and

- "Is there any contraindication to performing treatment?"

Questions?

Thanks for listening!

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